

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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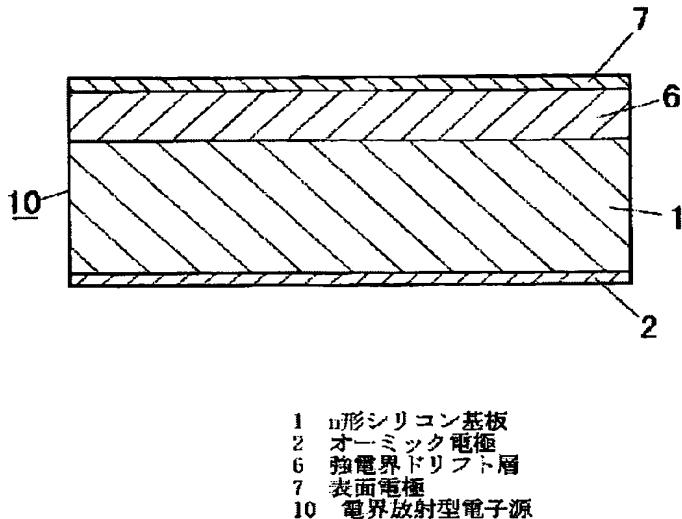
APPLICATION DATE : 18-10-99  
APPLICATION NUMBER : 11295951

APPLICANT : MATSUSHITA ELECTRIC WORKS LTD;

INVENTOR : AIZAWA KOICHI;

INT.CL. : H01J 1/312 H01J 9/02

TITLE : ELECTRIC FIELD RADIATION  
ELECTRON SOURCE AND METHOD  
FOR MANUFACTURING



ABSTRACT : PROBLEM TO BE SOLVED: To provide an electric field radiation electron source and method of fabricating it that enhances the electron emission effect with high withstand voltage.

SOLUTION: An electric field drift layer 6 is formed on the main surface of an n-type silicon substrate 1, having a surface electrode 7. An ohmic electrode 2 is formed in the inside of the silicon substrate 1. The strong electric field drift layer 6 is obtained by annealing a porous polycrystalline silicon layer formed by anode oxidizing process in an atmosphere of N<sub>2</sub>O or NO gas at 900°C for an hour. The polycrystalline layer thus obtained has high electron emission efficiency, low defect density, and high withstand voltage compared to the conventional silicon layer.

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